Ultrasound Scanning Pattern of Findings among Pregnant Women Undergoing Obstetric Scan in Aminu Kano Teaching Hospital, Nigeria

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Abstract

Obstetric scan has become a gold standard in terms of diagnosis of pregnancy from first to third trimester. It is also indispensable in the early diagnosis of the abnormal pregnancy and maternal reproductive organ abnormalities. The documented pattern of findings will serve as a guide to the practitioners in the management of women with pregnancy. The study aims at evaluating the pattern of ultrasound scanning findings in obstetric scan among pregnant women referred to the Aminu Kano Teaching Hospital for obstetrics scan. The study design was prospective and cross sectional conducted among pregnant women undergoing obstetric scan in the Radiology Department at the Aminu Kano Teaching Hospital from April 2019 to October 2019. Using simple random sampling method 384 subjects participated in the study. An ethical approval to conduct the study was sought and obtained from the Human Research and Ethics Committee of the Aminu Kano Teaching Hospital, and informed consent was obtained from all the selected participants. Obstetric ultrasound scan was performed on all the selected subjects using an ultrasound machine with a 7.5MHz linear transducer and the information was recorded on the data capture sheet. The obtained data were analyzed using SPSS version 23. Three hundred and sixty eight (95.8%) of the participants had normal obstetric scan, while 16 (4.2%) had an abnormal scan; 4 (1.0%) missed abortion, 3 (0.8%) hydrocephalus, 3 (0.8%) placenta previa, 2 (0.5%) ectopic pregnancy, 2 (0.5%) threatened abortion and 2 (0.5%) intrauterine fetal death. The majority of the pregnant women undergoing obstetric scan at the Aminu Kano Teaching Hospital had a normal obstetrics scan. However, missed abortion, hydrocephalus, placenta previa, ectopic pregnancy, threatened abortion and intrauterine fetal death were documented as abnormal findings.

Keywords: Aminu Kano Teaching Hospital, Hydrocephalus, Obstetric, Pattern, Scan,

INTRODUCTION

Pregnancy, also known as gestation, is the time during which one or more offspring develops inside a woman. A multiple pregnancy involves more than one offspring, such as twins. Pregnancy can occur from sexual intercourse or assisted reproductive technology (Kennedy, 2015). Childbirth typically occurs around 40 weeks from the last menstrual period. This is just over nine months, where each month averages 31 days. An embryo is the developing offspring during the first eight weeks following fertilization, after which, the term fetus is used until birth. Symptoms of early pregnancy may include missed periods, tender breasts, nausea and vomiting, hunger, and frequent urination. Pregnancy may be confirmed with obstetric

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ultrasound scanning (Kennedy, 2015). Pregnancy is typically divided into three trimesters. The first trimester started from week one to week 12, the possibility of miscarriage is at its highest probability. The second trimester started from week 13 to week 28. Around the middle of the second trimester, movement of the fetus may be felt. At 28 weeks, more than 90% of babies can survive outside of the uterus if provided with high-quality medical care, and the third trimester started from 29 weeks through 40 weeks. Obstetric ultrasound uses sound waves to produce images of the embryo or fetus within a pregnant woman, as well as the mother's uterus and ovaries. It does not use ionizing radiation, has no known harmful effects, and is the preferred method for monitoring pregnant women and their unborn babies. The ultrasound images are captured in real-time; as such they can show the structure and movement of the body's internal organs, as well as blood flowing through blood vessels (Beckmann, 2010). A Doppler ultrasound study is a technique that evaluates blood flow in the umbilical cord, fetus or placenta, this procedure requires no special preparation (Kennedy, 2015). The application of ultrasound in obstetrics cannot be overemphasized because it aids in the diagnosis and confirmation of early pregnancy, confirming the site of pregnancy, fetal viability, estimate the age of the pregnancy, evaluate the position of the placenta, determine if there are multiple pregnancies, evaluate the position of the fetus, determination of the amount of amniotic fluid around the baby and check for opening or shortening of the cervix, assess fetal growth, well-being and determination of the gender. Ultrasonography is also indispensable in the early diagnosis of ectopic pregnancies and molar pregnancies, diagnose congenital abnormalities of the fetus, such as down syndrome, ureterocele, teratology of Fallot, hydropsfetalis and hydronephrosis (Kennedy, 2015). Obstetric scanning is the gold standard in terms of diagnosis of pregnancy from first to third trimester. However, empirical study shows that there was no documented work on the patterns of trimester's findings in obstetrics scanning at AKTH. The findings of the study are expected to serve as a guide sonographers, sonologist, radiologist and obstetrician in the management of the pregnant women. The study aims at evaluating the pattern of findings in obstetric scan among pregnant women referred to the Aminu Kano Teaching Hospital for obstetrics scan.

MATERIALS AND METHODS
The study design was a prospective cross-sectional study conducted in the Radiology Department, Aminu Kano Teaching Hospital from April 2019 to October 2019. An ethical approval to conduct the study was obtained from the research and ethics committee of the Aminu Kano Teaching Hospital (AKTH/MAC/SUB/12A/P-3/VI/2784) and informed consent was obtained from all the selected subjects. Using convenience sampling method, 384 pregnant women that attended antenatal clinics were considered in this study,, those that declined and those that presented with other medical conditions were excluded from the study. Obstetric ultrasound scan was performed on all the selected subjects using an ultrasound machine with a 3.5 MHz linear transducer and the information was recorded on the data capture sheet. The information contained in the data capture sheet includes; age, parity, trimester, clinical indication and pattern of findings. The obtained data were analyzed using SPSS version 23.

RESULTS
The age of participants ranged 15-43years, with a mean value of 27.5 ± 6.60. Also 368 (95.6%) of participant had normal obstetric scan while 6 (4.4%) presented with abnormalities.
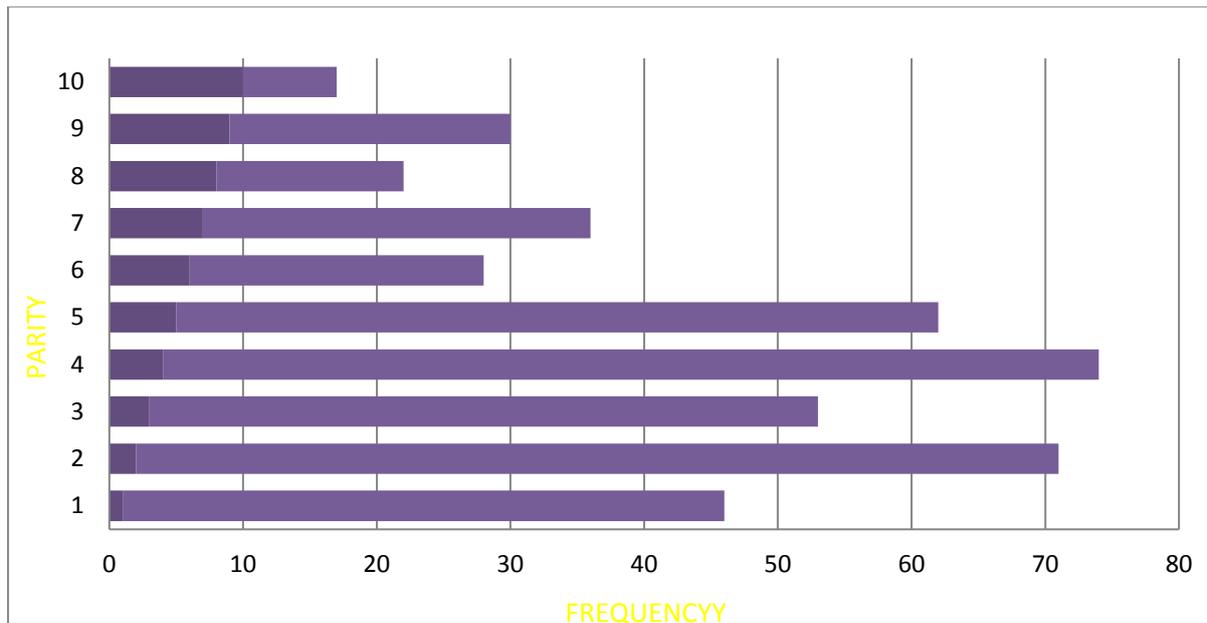
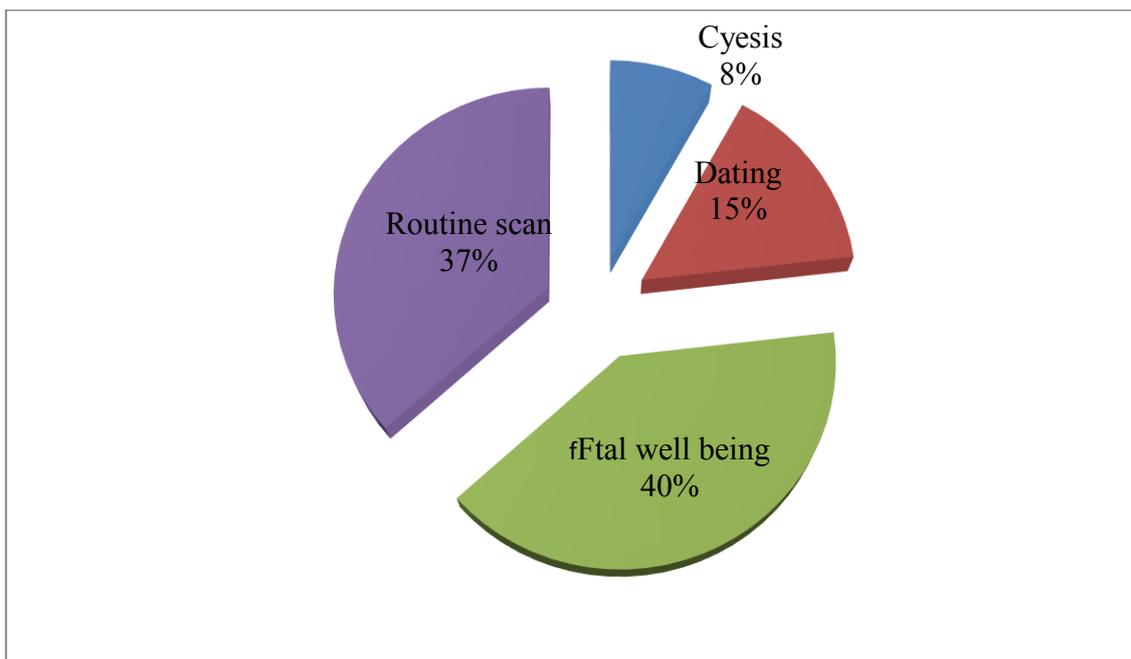**Figure 1: Frequency distribution of the parity among pregnant women attending AKTH**

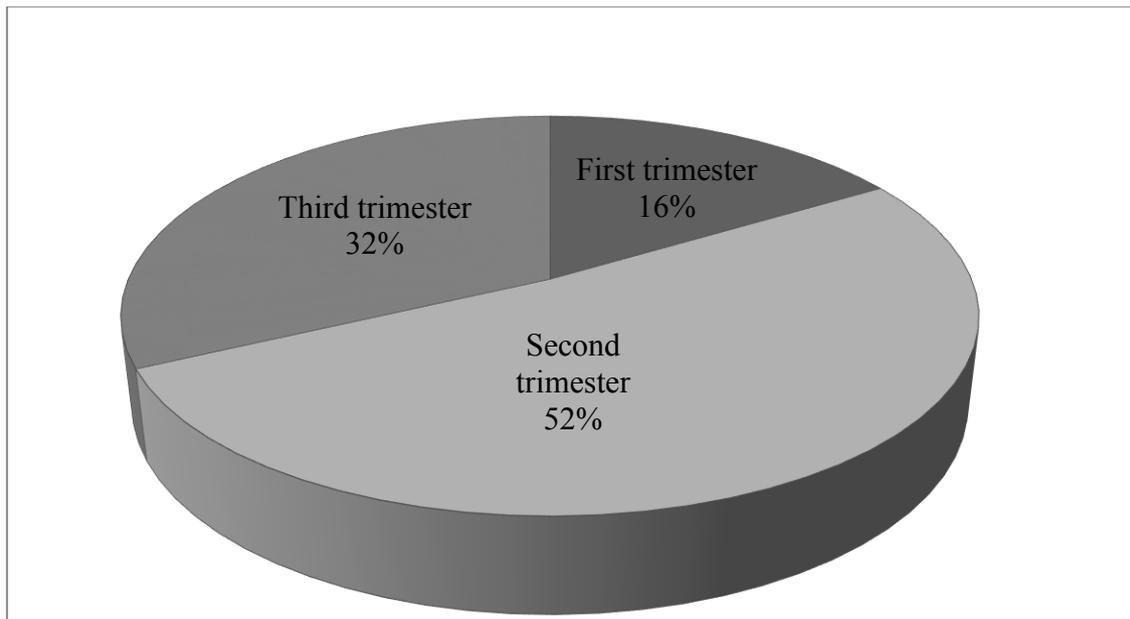**Figure 2: Clinical indications for performing the obstetrics scan among pregnant women attending AKTH**

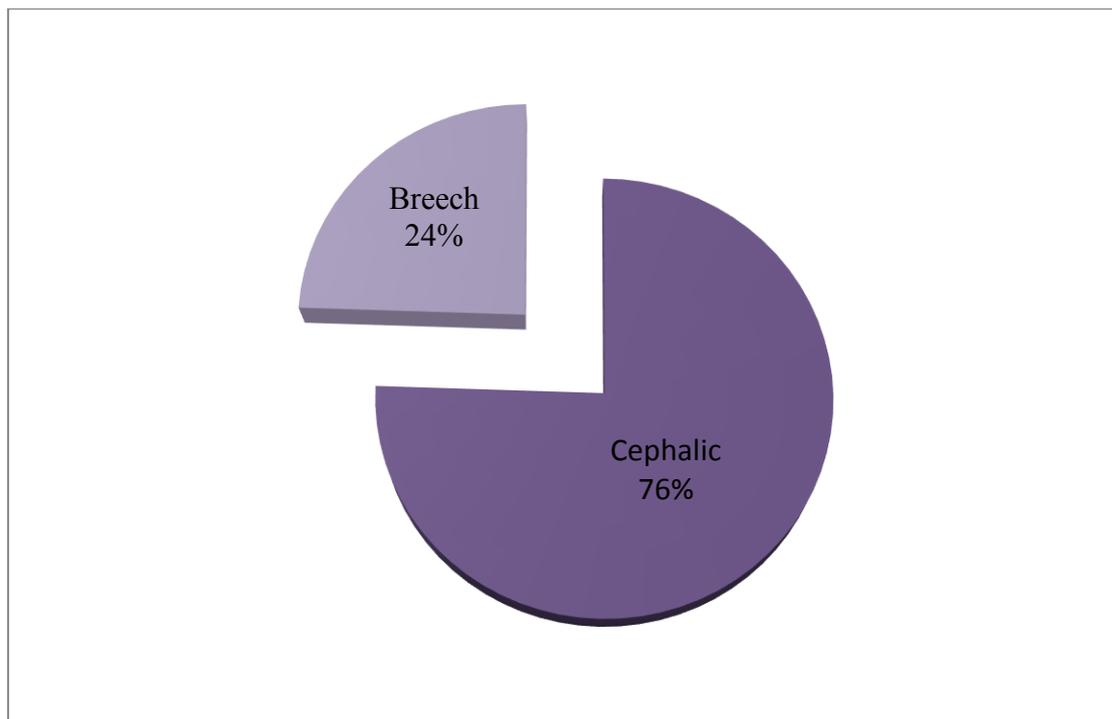**Figure 3: Trimesters of pregnancy among pregnant women attending AKTH**

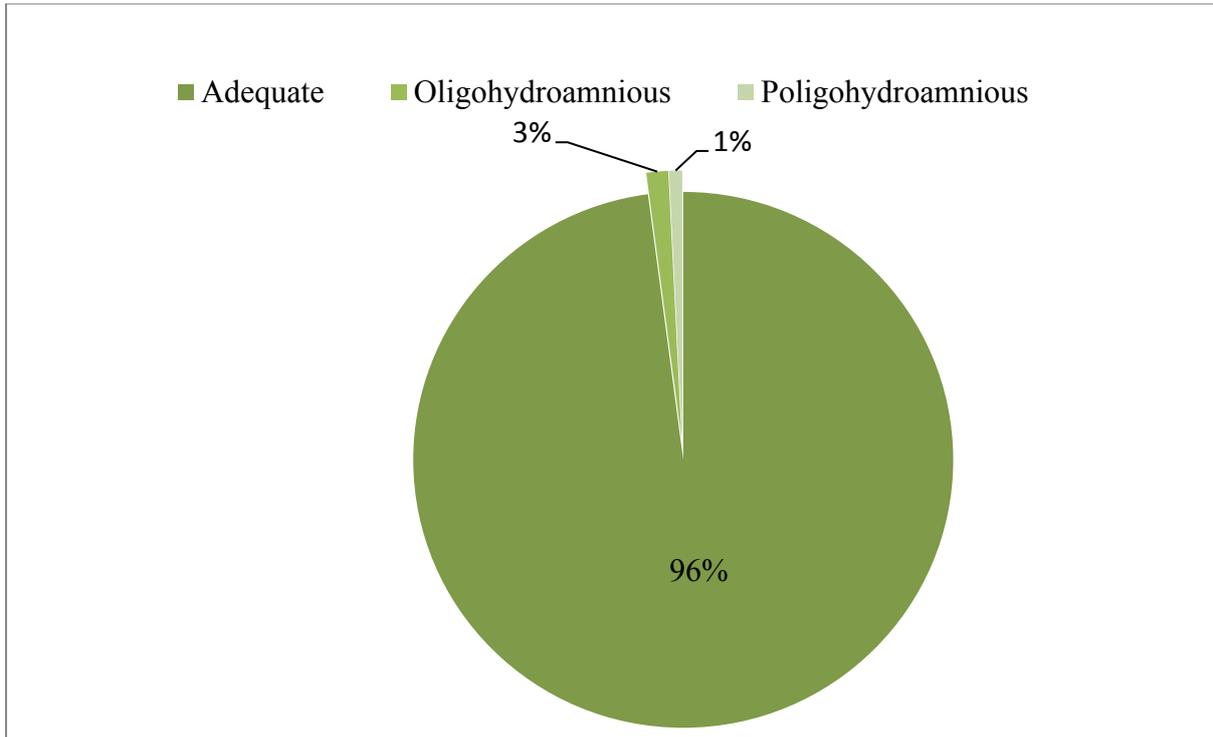**Figure 4: Fetal presentation among pregnant women attending AKTH**

Figure 5: Amniotic fluid volume among pregnant women attending AKTH
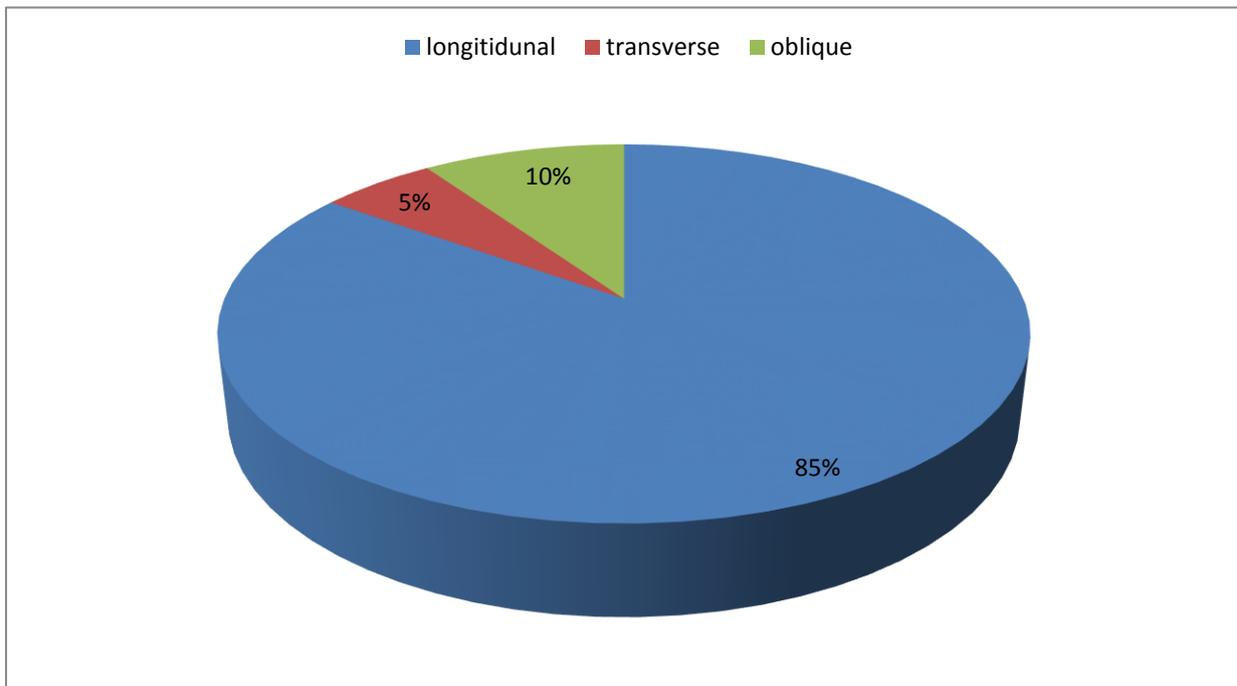

Figure 5: Fetal lie among pregnant women attending AKTH
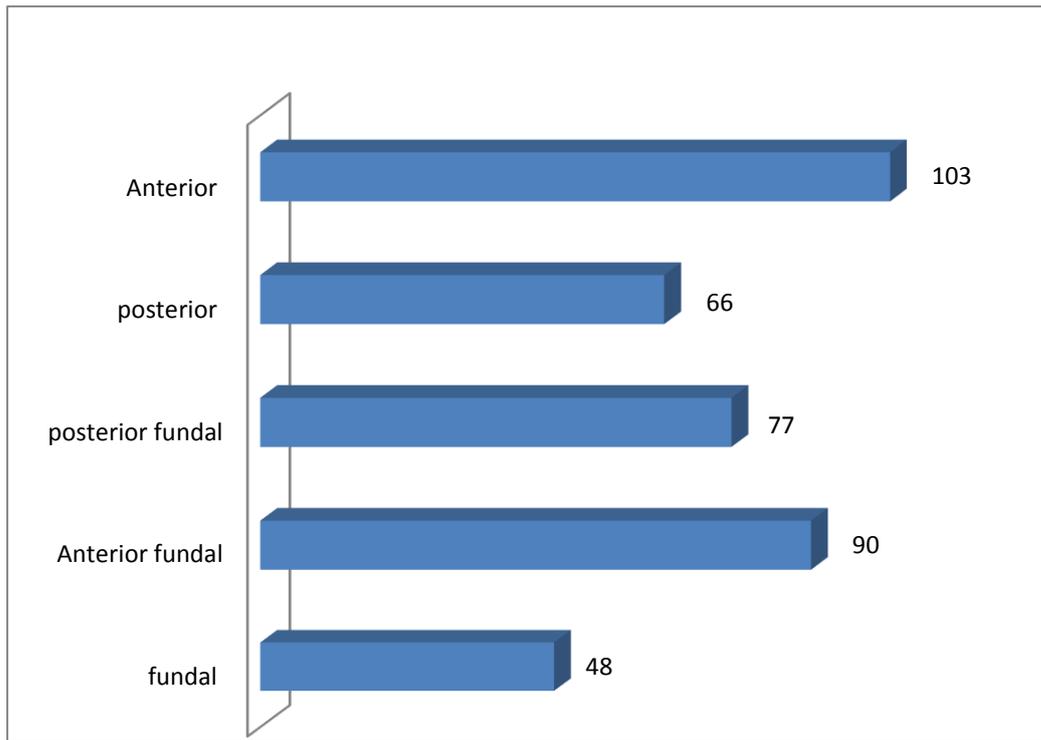
Figure 6: Placental position among pregnant women attending AKTH

Table 1: Frequency distribution of the fetal viability, gender and type of gestation among pregnant women attending AKTH

Findings	Frequency	Percentage (%)
Fetal viability		
viable	378	98.4
non viable	6	1.6
Fetal gender		
female	242	63
male	142	37
Type of gestation		
singleton	362	94.3
double	22	5.7

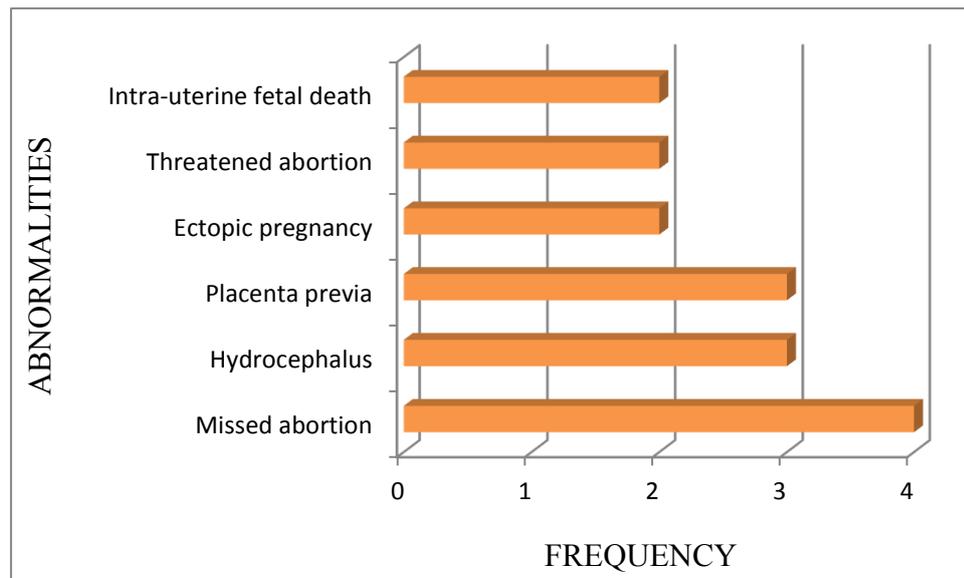**Figure 8: Abnormal finding among pregnant women attending AKTH**

DISCUSSION

The findings of the current study show that the age group of participants ranged between 15-43 years, with a mean value of 27.51 ± 6.60. The finding of the study is in agreement with those of the study conducted by Oche *et al*. (2013) in Sokoto which showed the age of the participant ranged 18 -40 years with a mean value of 26.9 ± 4.8. The possible reason of the agreement might be because the two studies were conducted in the same region of the country. However, the findings of the study are contrary to the findings of the study conducted by Ezem *et al*. (2011) in Owerri which showed that the age of the participants ranged between 20 - 60 years with a mean value of 31.74 ± 7.25. The differences noted might be due to the fact that the two studies were conducted in different regions of the country with different religious and socio-cultural characteristics. The findings of the study show that the minimum number of parity was one and maximum parity was ten and majority of the participants had a parity of less than or equal to five as shown in Figure 1. The findings of study which are similar to the findings of the study conducted by Oche *et al*. (2013) in Sokoto that showed the majority of the participants had a parity of less than five. The possible reason of the agreement might be the majority of the participants in the two studies have the sane religion and socio-cultural background. However, the findings of the study are contrary to those of the study conducted by Eze *et al,* (2010) in Enugu which showed that the minimum number of parity of participant is zero and the maximum number is equal to or greater than five pregnancies. The differences may be due to acceptance of family planning and late marriage in the eastern part of the country. The findings of the study show that fetal well-being was the most frequent 154 (40%) followed by routine obstetric scan 141 (37%), the pregnancy dating 58 (15%) and cyesis was 31 (8%) as shown in Figure 2. The findings of the study are similar to those of the study conducted by Oche *et al*. (2013) in Sokoto that showed fetal viability (38.0%) to be the most frequent indication. However, the findings of the study are contrary to those of the study conducted by Zira *et al*. (2017) in Bauchi which showed that pregnancy dating 850 (80.8%) had the highest indication, while Polyhydramnious internal os diameter/cervical length and molar gestation showed the least indication 1 (0.09%) each. This gives an indication that clinicians are interested in knowing fetal well-being ruling out maternal pregnancy complications that may endanger the fetus, the mother or both. The findings of the study show

that participants were presented for an obstetric scan at different stages of pregnancy, but most participants were presented during second trimester pregnancy198 (52%), third trimester with123 (32%) and the first trimester had the least 63 (16%) as shown in Figure 3.

However, the findings of the study are contrary to the findings of the studies conducted by Eze *et al*. (2009); Zira *et al*. (2017) which showed that most participants were presented during the third trimester 815 (40%) followed by the third trimester 632 (31.60%), and then second trimester had the least. The findings of the study also show that fetal presentation was cephalic in 290 (76%) of the participants and breech in the 94 (24%) of the participants as shown in Figure 4. The findings of the study are in line with the findings of the studies conducted by Zira *et al*. (2017); Kean, (1999) which showed that cephalic presentation was found in the 908 (89.37%); 456 (65.85%) of the participants and breech in the 108 (10.62%); 104 (23.5%) of the participants. Findings from various studies show that cephalic presentation is the most common physiologic and frequent fetal presentation, which is associated with a high rate of successful vaginal delivery as well as with the lowest frequency of complication. However, breech presentation is associated with fetal growth retardation, and abnormalities of amniotic fluid volume either oligohydroamnious or polyhydroamnious and in most cases require surgical intervention (Ferreira *et al*., 2015). The findings of the study show that participants with adequate amniotic fluid volume was found in the 369 (96%) of the participants, oligohyroamnious 11 (3%) and polygohydroamnious was found in 4 (1%) of the participants as shown in Figure 5. The findings of the study are in accordance with those of the study conducted by Luntsi *et al*. (2019) in Maiduguri which showed that participants with adequate amniotic fluid volume was found to be 192 (87.86%), while those with above normal range was found to be 25 (12.14%). Oligohydramnios, results in poor development of the lung tissue and can lead to intrauterine fetal death, whereas, polyhydramnios, alerts the clinician to possible fetal anomalies. The findings of the current study show that 326 (85%) of the participants presented with a longitudinal fetal lie, 27 (10%) had oblique fetal lie while only 21 (5%) presented with a transverse fetal lie as shown in Figure 6. The longitudinal fetal lie is the most common physiologic and frequent fetal presentation, which is associated with a higher rate of successful vaginal delivery as well as with the lowest frequency of complication more especially if the fetus has cephalic presentation. However, oblique and transverse fetal lie in most cases requires surgical intervention (Ferreira *et al*., 2015). The findings of the study show that anterior placental location was the highest 103 (26.8%) followed by antero-fundal placental location 90 (23.4%), however, the least encounter placental location was fundal 48 (12.5%) as shown in Figure 7. Furthermore, findings from this study show that 378 (98.4%) of obstetric scan conducted was a viable gestation with non-viable gestation of 6 (1.6%) as shown in Table 1. The findings of the study are in accordance with the findings of the study conducted by Zira *et al*. (2017), which reported 994 (94.58%) viable fetuses. As reported by Enakpene *et al*. (2018), the assessment of fetal viability may just be the reason why the woman and her immediate family members eagerly look forward to pregnancy confirmation after her missed menstrual periods in a society that hinges matrimonial success on the conception and eventual delivery of a live baby. The findings of the study also show that the female fetal sex was found to be 242 (63%), and male fetal sex was 142 (37%) as shown in Table 1. The findings of the study show that 362 (94.3%) of the participants had a singleton gestation while 22 (5.7%) had double gestations as shown in Table 1. The findings of the study are almost similar to the findings of the study conducted by Zira *et al*. (2017) that showed 1040 (99.42%) of the participants were having a singleton gestation while 6 (0.57%) had double gestation. The findings of the study show that abnormal pregnancy was found in 14 (4.4%) of the participants. The most frequent encounter abnormality was missed abortion followed by hydrocephalus and placenta previa, and then ectopic pregnancy, threatened abortion and intrauterine fetal death as shown in figure 8. The findings of the study are not in agreement

with the findings of the study conducted by Susawat, (2016), which showed that out of 500 cases studied, 196 pregnancies were normal, but 304 cases had abnormal ultrasonography findings. However, the two studies agreed on the most frequent encounter abnormality.

CONCLUSION
The majority of the pregnant women undergoing obstetric scan at the Aminu Kano Teaching Hospital had a normal obstetric scan. However, missed abortion, hydrocephalus, placenta previa, ectopic pregnancy, threatened abortion and intrauterine fetal death were reported as abnormal findings.

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